# SECTION 5
# CHECK AND ADJUSTMENT

After measurement and adjustment in accordance with SECTION 5, please surely clean the head.

## 5-1 LEAD SCREW ECCENTRICITY

Disassemble the following parts and then perform the measurement and adjustment.

a. Main Cover (Refer to 4-2)
b. Cassette-up Ass'y (Refer to 4-4)
c. Auto Eject Motor Ass'y and Arm Plate Ass'y (Refer to 4-10)

### 5-1-1 Tools and Measuring Equipment

a. Lead Screw Eccentricity Inspection Tool
b. Hexagon Wrench Torque Driver
c. Rotary Knob
d. Macintosh Computer
e. System Disk

### 5-1-2 Measurement

a. Connect the disk drive to Macintosh Computer. (Refer to Fig. 2-2)

a-1. Insert the system disk in place and move the head onto TRK 79

b. Turn off the power.
c. Attach the rotary knob onto the rear shaft of the stepping motor shaft with a hexagon wrench torque driver. (Refer to Fig. 4-8 (b)) Check if the gap between the motor bearing metal and rotary knob is approximately 0.5mm.
d. Revolve the rotary knob 3 to 4 turns counterclockwise by hand.
e. Aligning the positioning hole of the lead screw eccentricity tool to the positioning pin on the chassis ass'y, set the lead screw eccentricity inspection tool in place. (Refer to Fig. 5-1)
f. Turn the rotary knob clockwise or counterclockwise by hand. Check if the gap measures 50um (5 scales on the meter of the lead screw eccentricity inspection tool) or less.

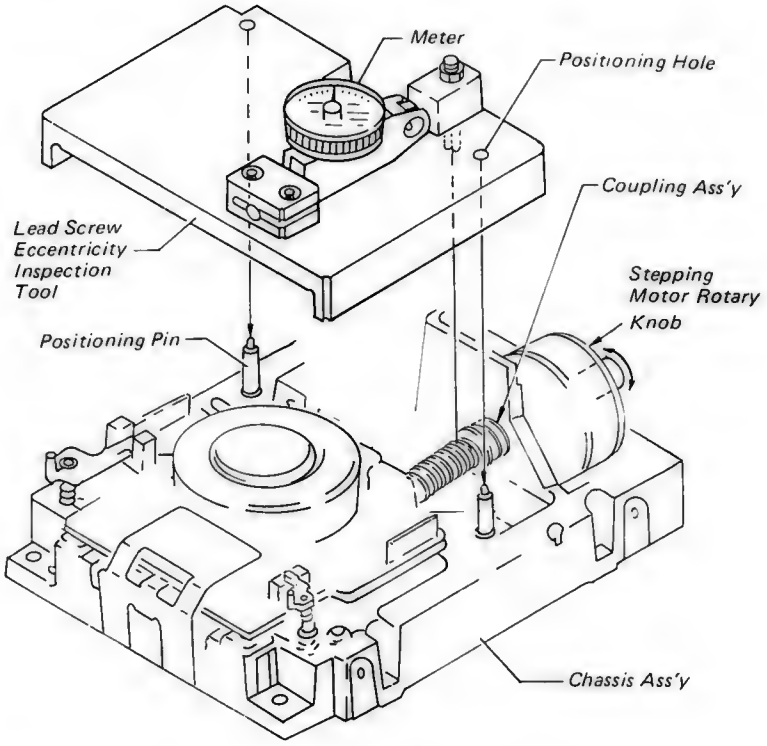



*Fig. 5-1 Lead Screw Eccentricity Adjustment*

### 5-1-3 Adjustment

a. Attach the rotary knob onto the stepping motor shaft. (Refer to Fig. 4-8 (b))
b. Loose with a hexagon wrench torque driver the two screws which fasten the coupling ass'y.
c. Pressing the coupling ass'y to the lead screw, fasten the setscrew for the lead screw with a hexagon wrench torque driver. (with a torque of 0.7 kg-cm)
d. Pulling the stepping motor shaft, fasten the setscrew for the stepping motor. (With a torque of 0.7 kg-cm)
e. Measure the lead screw eccentricity in accordance with 5-1-2. Unless the result meets the specification, measurement should be carried out again starting with item "a".

## 5-4 RADIAL ALIGNMENT AND TRK 00 SENSOR

Disassemble the following parts and then perform and adjustment.

a. Main Cover (Refer to 4-2)
b. Auto Eject Motor Ass'y and Arm Plate Ass'y (Refer to 4-10)

### 5-4-1 Tools and Measuring Equipment

a. Oscilloscope
b. Macintosh Computer
c. Reference Disk (OR-D85VA)
d. Geared Driver
e. Rotary Knob
f. TOTSU Screw Driver (M2.6)
g. - Driver 4mm
h. Hexagon Wrench Torque Driver
i. System Disk

### 5-4-2 Measurement

a. Connect the disk drive to Macintosh Computer. (Refer to Fig. 2-2) Insert the reference disk and system disk in place.
b. Connect the oscilloscope probe tip(CH-1) to CN107-1.
c. Move head onto TRK 40.
d. Check that CAT'S EYE PATTERN signal satisfies specification mentioned in SECTION 3-3-1 NORMAL OPERATION procedure TRACK POSITIONING.

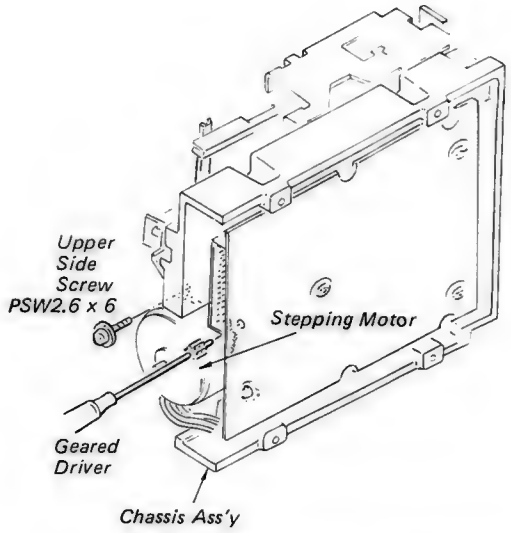
Note: The oscilloscope is adjusted to be triggered by index burst signal.

e. Move head back to TRK 01. (Do not overshift back. If head is overshifted back, follow steps d,e again.)
f. Check that DC level of CN107-5 is 3 - 4.5V.
g. Move head onto TRK 00.
h. Check that DC level of CN107-5 is less than 0.5V.

### 5-4-3 Adjustment

#### 1. Radial Alignment adjustment

a. Connect disk drive to Macintosh computer. (Refer to Fig. 2-2) Insert the system disk and reference disk and move head onto TRK 40.
b. Attach the rotary knob to rear shaft of the stepping motor with a hexagon wrench torque driver. (Refer to Fig. 4-8 (b))




*(a) Radial Alignment Adjustment*

c. Turn the rotary knob counterclockwise while stopping and starting at each clicking point until the CAT'S EYE PATTERN signal appears. Turning the stepping motor with the geared driver within the range that the screw fastening the stepping motor does not drop from the stepping motor flange, set the amplitude ratio of the peak signals on the CAT'S EYE PATTERN signal to the value specified in SECTION 3-3-1 NORMAL OPERATION procedure TRACK POSITIONING. (Refer to Fig. 5-4 (a))
d. Fasten the upper side screw (PSW2.6x6) and then apply nut lock paint to upper side screw. (Refer to Fig. 5-4 (b))

#### 2. TRK 00 sensor adjustment

a. Move head back onto track 01 (Don't overshift back. If head is overshifted back, confirm radial alignment adjustment again.)
b. Adjust TRK 00 sensor board so that DC level of CN107-5 is 3.5 - 4.5V. (Refer to Fig. 5-4 (b))

c. Move head onto TRK 00 and check that DC level of CN107-5 is less than 0.5V. (Refer to Fig. 5-4 (b))
d. Power off the power supply to the drive and several seconds later power on again, move the head to TRK 40, check that level of CAT'S EYE PATTERN signal on TRK 40 satisfies specifications in SECTION 3-3-1 NORMAL OPERATION procedure TRACK POSITIONING.
e. If the specification is not satisfied, confirm radial alignment adjustment once more.
f. If specification is not satisfied in radial alignment adjustment follow "5-5 stepping motor load torque".
g. Fasten the upper side screw (PSW 2.6x6) and apply nut lock paint.
h. Install the auto eject motor ass'y. (Refer to 4-10)
i. Joint one end of arm plate ass'y to one side with E-ring (E2.3). (Refer to Fig. 4-10 (a))
j. Install the main cover. (Refer to 4-2)

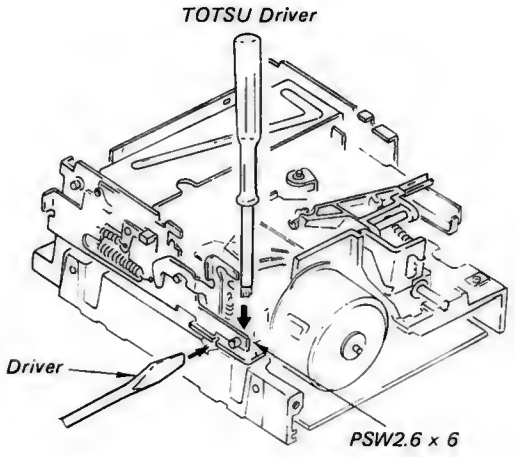



*Fig. 5-4 (b) TRK 00 Sensor Adjustment*

## 6-2 MECHANICAL PARTS LIST

Note: 1. Parts printed in **Bold-Face type** are normally stocked for replacement purposes. The remaining parts shown in this list are not normally required for routine service work. Orders for parts not shown in **Bold-Face type** will be processed, but allow for additional delivery time.

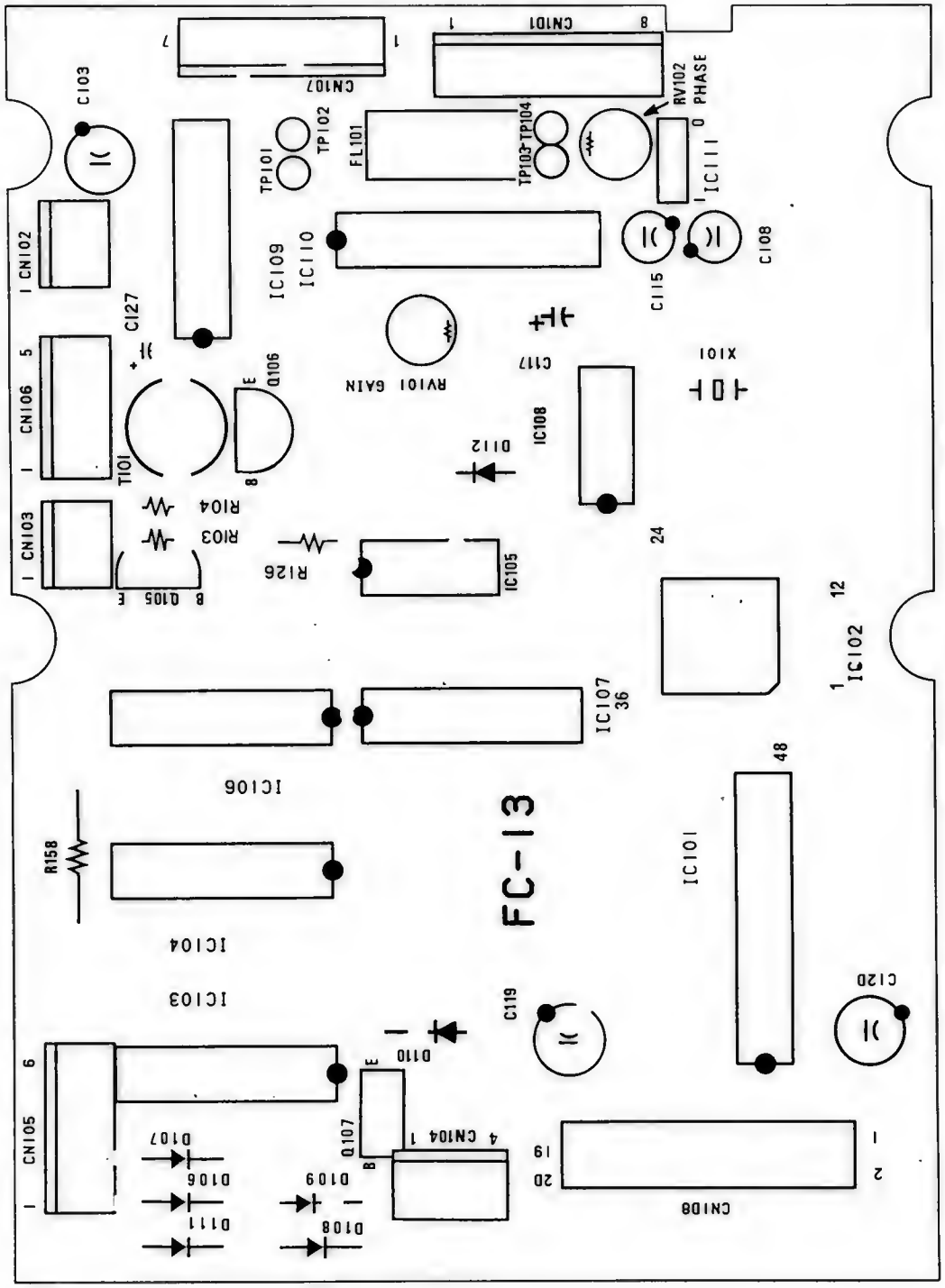
| No. | Description | P/No. |
|---|---|---|
| 1 | **HEAD ARM ASS'Y** | **A-8010-028-B** |
| 2 | **CASSETTE-UP ASS'Y** | **A-8010-038-A** |
| 3 | **COUPLING ASS'Y** | **A-8010-014-B** |
| 4 | **DC MOTOR (STEPPING MOTOR)** | **8-838-025-11** |
| 5 | SENSOR MOUNTED BPOARD | A-8050-001-A |
| 6 | **DC MOTOR (DISK MOTOR)** | **8-838-060-01** |
| 7 | EJECT MOTOR ASS'Y | A-8010-040-A |
| 8 | FC-13 MOUNTED BOARD | A-8051-058-A |
| 9 | **COMPRESSION SPRING** | **3-659-609-00** |
| 10 | COMPRESSION SPRING | 4-601-083-00 |
| 11 | **TENSION SPRING** | **4-847-057-00** |
| 12 | **TENSION SPRING** | **4-603-901-00** |
| 13 | **TENSION SPRING** | **3-305-652-00** |
| 14 | **TENSION SPRING** | **4-603-936-00** |
| 15 | **PAD ASS'Y** | **A-8010-020-A** |
| 16 | PLATE ARM ASS'Y | A-8010-041-A |
| 17 | MAIN COVER | 4-603-953-04 |
| 18 | WP ARM | 4-601-009-04 |
| 19 | D-DETECTION ARM | 4-603-927-00 |
| **20** | **ROLLER (A)** | **4-603-950-02** |
| 21 | **ROLLER (B)** | **4-603-948-00** |
| 22 | HEAT SINK | 4-603-972-02 |
| 23 | TAB TERMINAL | 4-604-740-01 |
| | SCREW, +PS 2x5 | 7-628-253-15 |
| | SCREW, +PS 2x10 | 7-628-253-45 |
| | SCREW, TOTSU PS 2.6x6 | 7-621-972-25 |
| | SCREW, TOTSU PSW 2.6x6 | 7-621-981-15 |
| | SCREW, TOTSU PSW 2.6x8 | 7-621-981-25 |
| | SCREW, TOTSU B 2.6x4 | 7-621-912-10 |
| | WASHAR, 6 | 3-701-444-11 |
| | SET-SCT HEX 2X2.5 FLAT POINT | 7-621-731-08 |
| | SET-SCT HEX 2.6x4 | 7-621-735-09 |
| | STOP RING 2.3, TYPE -E | 7-624-105-04 |
| | STOP RING 3.0, TYPE -E | 7-624-106-04 |
| | STOP RING 4.0, TYPE -E | 7-624-108-04 |



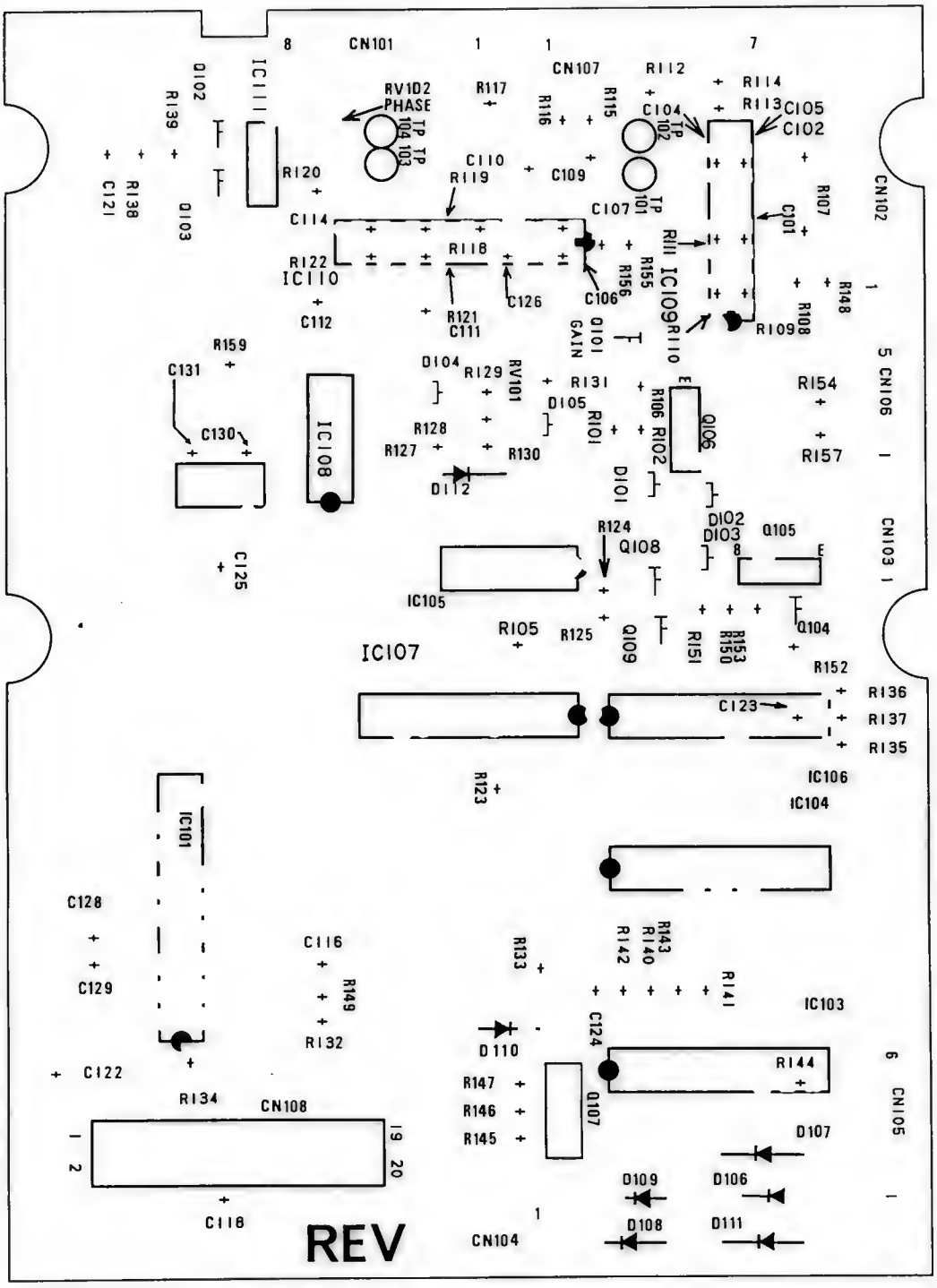
ORIGINAL ISSUE 6/ 1/84
REVISED ISSUE 6/15/84

6-4-2 Parts Layout on FC-13 mounted board

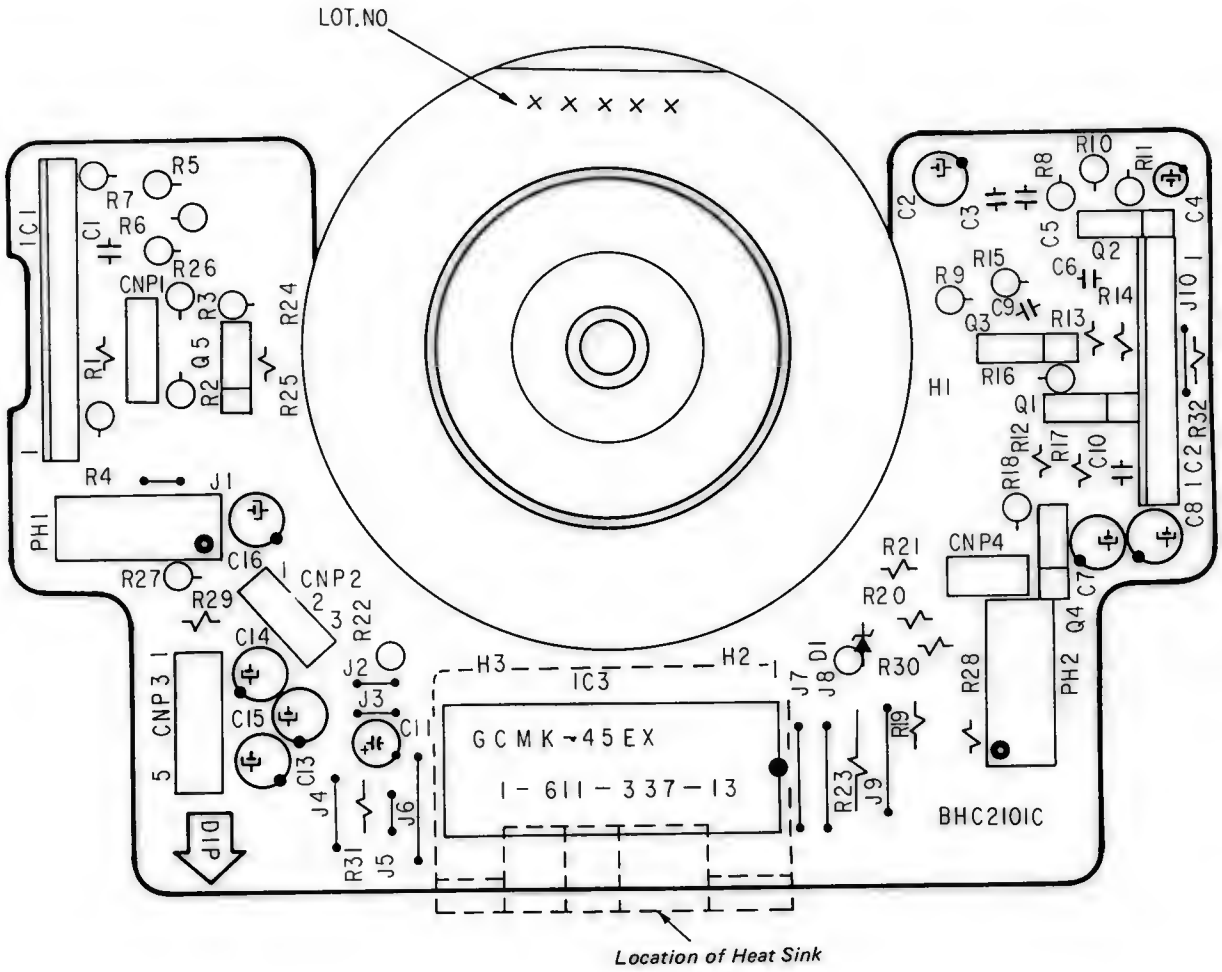
-Component Side-



-Pattern Side-



6-4-4 Parts Layout on Disk Motor Circuit Board



## 6-5 ELECTRIC PARTS

### 6-5-1 Chip parts replacement procedure

This unit uses chip components such as carbon resistor, ceramic capacitor, transistor and diode in some circuits. It also uses IC's of flat-pack type. As the appearance of carbon resistor and ceramic capacitor are identical, destinguishment of each can be possible by visual check of reference address of silk-screen print on the printed circuit board. As the shape of transistor and diode are same, they also are distinguished by the reference address of silk-screen print.

**Tools:**

Soldering iron: 20W (If possible, use soldering tip with heat- controller of 270±10°C) Desoldering metal braid ("SOLDER TAUL" or equivalent)
Solder (of 0.6mm dia. is recom mended.)
Tweezers
Cutter
Ohmmeter

**Soldering Conditions:**

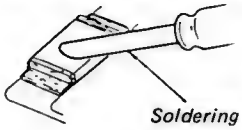
Tip temperature; 270±10°C
Solder within 2sec. per an electrode
Higher temperature or longer tip application than specified may be damaged to the chip component.

**(1) Resistor and capacitor**

(1) Add heat onto the chip-part by the top of soldering iron tip and slide the chip-part aside when the solder is melted.
(2) Confirm visually with care that there is no pattern peeling, damage, and/or bridge where the part was removed or its surrounding.
(3) Presolder the pattern into thin where the part was removed.
(4) Place a new chip-part onto the pattern and solder both sides.

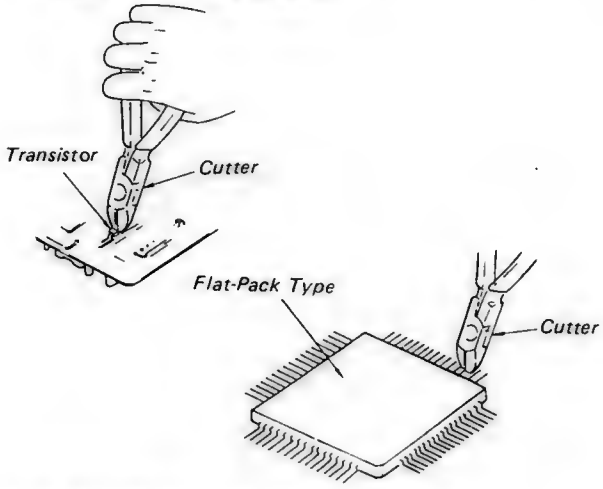
**CAUTION:**

Do not use the chip-part again once used.




**(2) Transistor and diode**

(1) Cut the leads of the semiconductor part to be removed with a cutter.
(2) Remocve the leads cut as the above, and confirm visually that there is no pattern peeling, any damage and/or bridge where the part was removed or its surrounding.
(3) Confirm visually with care that there is no pattern peeling, damage, and/or bridge where the part was removed or its surrounding.
(4) Presolder the pattern into thin where the part was removed.
(5) Place a new chip-part onto the pattern and solder the leads.




**(3) IC (Flat-pack type)**

(1) Cut the leads of the IC to be removed with a cutter.
(2) Remove the each pin of IC from the pattern by tweezers while heating the pin by soldering iron.
(3) Confirm visually with care that there is no pattern peeling, damage, and/or bridge where the part was removed or its surrounding.
(4) Presolder the pattern into thin where the part was removed.
(5) Place a new IC onto the pattern and solder it.
(6) Confirm by a ohmmeter that each conduction between IC's terminal and upper port is surely made.
(7) If not, resolder the portion.

## 6-5-2 ELECTRIC PARTS LIST

**NOTE:** 1. All capacitors are in micro farads unless otherwise specified.

2. All inductors are in micro henries unless otherwise specified.

3. All resistors are in ohms.

4. "CHIP" stands for chip componemt.

| Ref. No. | Parts No. | Description | | |
|---|---|---|---|---|
| **CAPACITORS** | | | | |
| C101 | 1-163-011-00 | CERAMIC CHIP 0.0015 | 10% | 50V |
| C102 | 1-163-035-00 | CERAMIC CHIP 0.0470 | | 50V |
| C103 | 1-123-821-00 | ELECT 47 | 20% | 16V |
| C104 | 1-163-021-00 | CERAMIC CHIP 0.01 | 10% | 50V |
| C105 | 1-163-021-00 | CERAMIC CHIP 0.01 | 10% | 50V |
| C106 | 1-163-247-00 | CERAMIC CHIP 68P | 5% | 50V |
| C107 | 1-163-035-00 | CERAMIC CHIP 0.047 | | 50V |
| C108 | 1-123-622-00 | ELECT 22 | 20% | 16V |
| C109 | 1-163-035-00 | CERAMIC CHIP 0.047 | | 50V |
| C110 | 1-163-035-00 | CERAMIC CHIP 0.047 | | 50V |
| C111 | 1-163-259-00 | CERAMIC CHIP 220P | 5% | 50V |
| C112 | 1-163-259-00 | CERAMIC CHIP 220P | 5% | 50V |
| C114 | 1-163-035-00 | CERAMIC CHIP 0.047 | | 50V |
| C115 | 1-123-622-00 | ELECT 22 | 20% | 16V |
| C117 | 1-131-371-00 | TANTALUM 10 | 10% | 16V |
| C118 | 1-163-259-00 | CERAMIC CHIP 220P | 5% | 50V |
| C119 | 1-123-821-00 | ELECT 47 | 20% | 16V |
| C120 | 1-123-821-00 | ELECT 47 | 20% | 16V |
| C121 | 1-163-038-00 | CERAMIC CHIP 0.1 | | 25V |
| C122 | 1-163-038-00 | CERAMIC CHIP 0.1 | | 25V |
| C123 | 1-163-038-00 | CERAMIC CHIP 0.1 | | 25V |
| C124 | 1-163-038-00 | CERAMIC CHIP 0.1 | | 25V |
| C125 | 1-163-038-00 | CERAMIC CHIP 0.1 | | 25V |
| C126 | 1-131-035-00 | CERAMIC CHIP 0.047 | | 50V |
| C127 | 1-131-350-00 | TANTALUM 3.3 | 10% | 35V |
| C128 | 1-163-259-00 | CERAMIC CHIP 220P | 5% | 50V |
| C129 | 1-163-247-00 | CERAMIC CHIP 68P | 5% | 50V |
| C130 | 1-163-247-00 | CERAMIC CHIP 100P | 5% | 50V |
| C131 | 1-163-247-00 | CERAMIC CHIP 100P | 5% | 50V |
| **CONNECTORS** | | | | |
| CN101 | 1-560-361-00 | CONNECTOR POST HEADER, ILG (8P) | | |
| CN103 | 1-560-357-00 | CONNECTOR POST HEADER, ILG (3P) | | |
| CN104 | 1-560-366-00 | CONNECTOR POST HEADER, ILG (4P) | | |
| CN105 | 1-560-360-00 | CONNECTOR POST HEADER, ILG (6P) | | |
| CN106 | 1-560-359-00 | CONNECTOR POST HEADER, ILG (5P) | | |
| CN107 | 1-560-619-00 | CONNECTOR POST HEADER, ILG 7P | | |
| CN108 | 1-564-359-00 | HEADER, CONNECTOR 20P | | |
| **DIODES** | | | | |
| D101 | 8-719-101-23 | 1SS123 (CHIP) | | |
| D102 | 8-719-101-23 | 1SS123 (CHIP) | | |
| D103 | 8-719-100-05 | 1S2837 (CHIP) | | |
| D104 | 8-719-105-64 | RD4.3M-B2 (CHIP) | | |
| D105 | 8-719-106-43 | RD9.1M-B1 (CHIP) | | |
| D106 | 8-719-923-48 | 1S2348H | | |
| D107 | 8-719-923-48 | 1S2348H | | |
| D108 | 8-719-923-48 | 1S2348H | | |
| D109 | 8-719-923-48 | 1S2348H | | |
| D110 | 1-217-587-00 | SHORT WIRE 0.02 | | |
| D111 | 8-719-923-48 | 1S2348H | | |
| D112 | 8-719-981-01 | ERA81-004 | | |

| Ref. No. | Parts No. | Description | | |
|---|---|---|---|---|
| **FILTER** | | | | |
| FL101 | 1-235-269-00 | FILTER, LOW PASS | | |
| **ICS** | | | | |
| IC101 | 8-759-909-58 | IC HAL16L8CN | | |
| IC102 | 8-759-908-30 | IC MB8847-1199M | | |
| IC103 | 8-759-120-03 | IC UPA2003C | | |
| IC104 | 8-759-900-05 | IC SN74LS05N | | |
| IC105 | 8-759-354-52 | IC HD75452P | | |
| IC106 | 8-759-900-04 | IC SN74LS04N | | |
| IC107 | 8-759-900-26 | IC SN74LS26N | | |
| IC108 | 8-759-103-93 | IC uPC393C | | |
| IC109 | 8-759-005-92 | IC NE592N | | |
| IC110 | 8-759-000-07 | IC MC3470AP | | |
| IC111 | 8-759-178-05 | IC UPC78L05 | | |
| **TRANSISTORS** | | | | |
| Q101 | 8-729-162-44 | 2SB624 (CHIP) | | |
| Q102 | 8-729-271-22 | 2SC2712-G (CHIP) | | |
| Q103 | 8-729-271-22 | 2SC2712-G (CHIP) | | |
| Q104 | 8-729-162-44 | 2SB624 (CHIP) | | |
| Q105 | 8-729-201-04 | 2SC2878 | | |
| Q106 | 8-729-201-04 | 2SC2878 | | |
| Q107 | 8-729-103-43 | 2SB734-4 | | |
| Q108 | 8-729-162-44 | 2SB624 (CHIP) | | |
| Q109 | 8-729-900-53 | DTC114EK (CHIP) | | |
| **RESISTORS** | | | | |
| R101 | 1-216-077-00 | METAL CHIP 15K | 5% | 1/10W |
| R102 | 1-216-077-00 | METAL CHIP 15K | 5% | 1/10W |
| R103 | 1-214-122-00 | METAL 390 | 1% | 1/4W |
| R104 | 1-214-122-00 | METAL 390 | 1% | 1/4W |
| R105 | 1-216-057-00 | METAL CHIP 2.2K | 5% | 1/10W |
| R106 | 1-216-057-00 | METAL CHIP 2.2K | 5% | 1/10W |
| R107 | 1-216-041-00 | METAL CHIP 470 | 5% | 1/10W |
| R108 | 1-216-041-00 | METAL CHIP 470 | 5% | 1/10W |
| R109 | 1-216-065-00 | METAL CHIP 4.7K | 5% | 1/10W |
| R110 | 1-216-065-00 | METAL CHIP 4.7K | 5% | 1/10W |
| R111 | 1-216-021-00 | METAL CHIP 68 | 5% | 1/10W |
| R112 | 1-216-009-00 | METAL CHIP 22 | 5% | 1/10W |
| R113 | 1-216-089-00 | METAL CHIP 47K | 5% | 1/10W |
| R114 | 1-216-089-00 | METAL CHIP 47K | 5% | 1/10W |
| R115 | 1-216-041-00 | METAL CHIP 470 | 5% | 1/10W |
| R116 | 1-216-041-00 | METAL CHIP 470 | 5% | 1/10W |
| R117 | 1-216-049-00 | METAL CHIP 1K | 5% | 1/10W |
| R118 | 1-216-049-00 | METAL CHIP 1K | 5% | 1/10W |
| R119 | 1-216-033-00 | METAL CHIP 220 | 5% | 1/10W |
| R120 | 1-216-073-00 | METAL CHIP 10K | 5% | 1/10W |
| R121 | 1-216-067-00 | METAL CHIP 5.6K | 5% | 1/10W |
| R122 | 1-216-061-00 | METAL CHIP 3.3K | 5% | 1/10W |
| R123 | 1-216-061-00 | METAL CHIP 3.3K | 5% | 1/10W |
| R124 | 1-216-059-00 | METAL CHIP 2.7K | 5% | 1/10W |
| R125 | 1-216-053-00 | METAL CHIP 1.5K | 5% | 1/10W |

| Ref. No. | Parts No. | Description | | | |
|---|---|---|---|---|---|
| R126 | 1-212-517-00 | METAL | 220 | 1% | 1/2W |
| R127 | 1-216-085-00 | METAL CHIP | 33K | 5% | 1/10W |
| R128 | 1-216-053-00 | METAL CHIP | 1.5K | 5% | 1/10W |
| R129 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R130 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| R131 | 1-216-043-00 | METAL CHIP | 560 | 5% | 1/10W |
| R132 | 1-216-061-00 | METAL CHIP | 3.3K | 5% | 1/10W |
| R133 | 1-216-061-00 | METAL CHIP | 3.3K | 5% | 1/10W |
| R134 | 1-216-061-00 | METAL CHIP | 3.3K | 5% | 1/10W |
| R135 | 1-216-077-00 | METAL CHIP | 15K | 5% | 1/10W |
| R136 | 1-216-037-00 | METAL CHIP | 330 | 5% | 1/10W |
| R137 | 1-216-037-00 | METAL CHIP | 330 | 5% | 1/10W |
| R138 | 1-216-041-00 | METAL CHIP | 470 | 5% | 1/10W |
| R139 | 1-216-041-00 | METAL CHIP | 470 | 5% | 1/10W |
| R140 | 1-216-065-00 | METAL CHIP | 4.7K | 5% | 1/10W |
| R141 | 1-216-065-00 | METAL CHIP | 4.7K | 5% | 1/10W |
| R142 | 1-216-065-00 | METAL CHIP | 4.7K | 5% | 1/10W |
| R143 | 1-216-065-00 | METAL CHIP | 4.7K | 5% | 1/10W |
| R144 | 1-216-295-00 | METAL CHIP | 0 | 5% | 1/10W |
| R145 | 1-216-061-00 | METAL CHIP | 3.3K | 5% | 1/10W |
| R146 | 1-216-061-00 | METAL CHIP | 3.3K | 5% | 1/10W |
| R147 | 1-216-061-00 | METAL CHIP | 3.3K | 5% | 1/10W |
| R149 | 1-216-295-00 | METAL CHIP | 0 | 5% | 1/10W |
| R150 | 1-216-057-00 | METAL CHIP | 2.2K | 5% | 1/10W |
| R151 | 1-216-057-00 | METAL CHIP | 2.2K | 5% | 1/10W |
| R152 | 1-216-061-00 | METAL CHIP | 3.3K | 5% | 1/10W |
| R153 | 1-216-053-00 | METAL CHIP | 1.5K | 5% | 1/10W |
| R154 | 1-216-053-00 | METAL CHIP | 1.5K | 5% | 1/10W |
| R155 | 1-216-057-00 | METAL CHIP | 2.2K | 5% | 1/10W |
| R156 | 1-216-057-00 | METAL CHIP | 2.2K | 5% | 1/10W |
| R157 | 1-216-053-00 | METAL CHIP | 1.5K | 5% | 1/10W |
| R159 | 1-216-057-00 | METAL CHIP | 2.2K | 5% | 1/10W |

**VARIABLE RESISTORS**

| | | |
|---|---|---|
| RV101 | 1-226-772-00 | RES, ADJ, METAL GLAZE 4.7K |
| RV102 | 1-226-774-00 | RES, ADJ, METAL GLAZE 47K |

**TRANSFORMER**

| | | |
|---|---|---|
| T101 | 1-426-073-00 | TRANSFORMER, RF |

**OSCILLATOR**

| | | |
|---|---|---|
| X101 | 1-567-263-11 | OSCILLATOR, CERAMIC |

**DISK DRIVE DC MOTOR BOARD (BHC-2101C)**

**CAPACITORS**

| | | | | | |
|---|---|---|---|---|---|
| C1 | 1-161-051-00 | CERAMIC | 0.01 | 10% | 50V |
| C2 | 1-123-611-00 | ELECT | 1 | 20% | 50V |
| C3 | 1-161-047-00 | CERAMIC | 0.0047 | 10% | 50V |
| C4 | 1-131-341-00 | TANTALUM | 0.1 | 20% | 35V |
| C5 | 1-136-214-11 | FILM | 0.012 | 5% | 100V |
| C6 | 1-130-475-00 | MYLAR | 0.0022 | 5% | 50V |
| C7 | 1-123-617-00 | ELECT | 10 | 20% | 16V |
| C8 | 1-123-610-00 | ELECT | 0.47 | 20% | 50V |
| C9 | 1-161-039-00 | CERAMIC | 0.001 | 10% | 50V |
| C10 | 1-130-489-00 | MYLAR | 0.033 | 5% | 50V |
| C11 | 1-123-608-00 | ELECT | 0.22 | 20% | 50V |
| C13 | 1-123-617-00 | ELECT | 10 | 20% | 16V |
| C14 | 1-123-617-00 | ELECT | 10 | 20% | 16V |
| C15 | 1-123-617-00 | ELECT | 10 | 20% | 16V |
| C16 | 1-123-617-00 | ELECT | 10 | 20% | 16V |

| Ref. No. | Parts No. | Description |
|---|---|---|

**DIODES**

| | | |
|---|---|---|
| D1 | 8-719-100-23 | RD4.3EB2T |
| PH1 | 8-719-902-90 | PHOTO INTERRUPTOR SPI201-20 |
| PH2 | 8-719-902-90 | PHOTO INTERRUPTOR SPI201-20 |

**ICS**

| | | |
|---|---|---|
| IC1 | 8-759-700-08 | IC NJM4558S |
| IC2 | 8-759-600-69 | IC CX-069A |
| IC3 | 8-759-202-02 | IC TA7259P |

**TRANSISTORS**

| | | |
|---|---|---|
| Q1 | 8-729-993-72 | 2SA937 |
| Q2 | 8-729-902-11 | 2SC2021 |
| Q3 | 8-729-993-72 | 2SA937 |
| Q4 | 8-729-902-11 | 2SC2021 |
| Q5 | 8-729-902-11 | 2SC2021 |

**RESISTORS**

| | | | | | |
|---|---|---|---|---|---|
| R1 | 1-247-807-00 | CARBON | 100 | 5% | 1/6W |
| R2 | 1-247-849-00 | CARBON | 5.6K | 5% | 1/6W |
| R3 | 1-247-849-00 | CARBON | 5.6K | 5% | 1/6W |
| R4 | 1-247-879-00 | CARBON | 100K | 5% | 1/6W |
| R5 | 1-247-879-00 | CARBON | 100K | 5% | 1/6W |
| R6 | 1-247-838-00 | CARBON | 2K | 5% | 1/6W |
| R7 | 1-247-879-00 | CARBON | 100K | 5% | 1/6W |
| R8 | 1-247-847-00 | CARBON | 4.7K | 5% | 1/6W |
| R9 | 1-247-848-00 | CARBON | 5.1K | 5% | 1/6W |
| R10 | 1-247-845-00 | CARBON | 3.9K | 5% | 1/6W |
| R11 | 1-247-833-00 | CARBON | 1.2K | 5% | 1/6W |
| R12 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W |
| R13 | 1-247-881-00 | CARBON | 120K | 5% | 1/6W |
| R15 | 1-247-862-00 | CARBON | 20K | 5% | 1/6W |
| R16 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W |
| R17 | 1-247-879-00 | CARBON | 100K | 5% | 1/6W |
| R18 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W |
| R19 | 1-247-890-00 | CARBON | 300K | 5% | 1/6W |
| R20 | 1-247-828-00 | CARBON | 750 | 5% | 1/6W |
| R21 | 1-247-828-00 | CARBON | 750 | 5% | 1/6W |
| R22 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W |
| R23 | 1-212-947-51 | FUSIBLE | 3.6 | 5% | 1/2W |
| R24 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W |
| R25 | 1-247-843-00 | CARBON | 3.3K | 5% | 1/6W |
| R26 | 1-247-843-00 | CARBON | 3.3K | 5% | 1/6W |
| R27 | 1-247-838-00 | CARBON | 2K | 5% | 1/6W |
| R28 | 1-247-838-00 | CARBON | 2K | 5% | 1/6W |
| R29 | 1-247-849-00 | CARBON | 5.6K | 5% | 1/6W |
| R30 | 1-247-849-00 | CARBON | 5.6K | 5% | 1/6W |
| R31 | 1-247-894-00 | CARBON | 430K | 5% | 1/6W |
| R32 | 1-247-897-00 | CARBON | 560K | 5% | 1/6W |

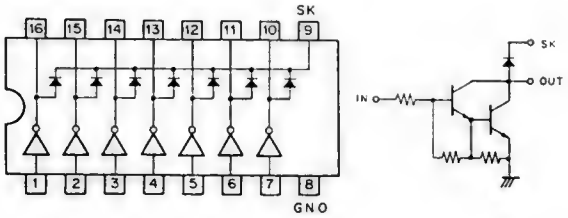
## 6-6 TRANSISTORS / DIODES / ICS PIN ARRANGEMENT

RD4.3EB2T

ERA81-004

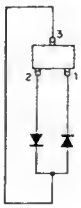
1S2348H

μPA2003C (NEC)
HIGH GAIN AMPLIFIER
– TOP VIEW –

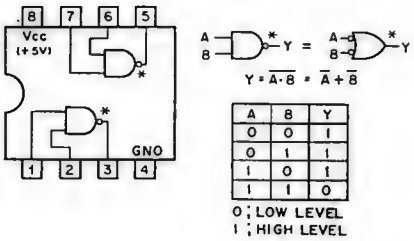



1SS123

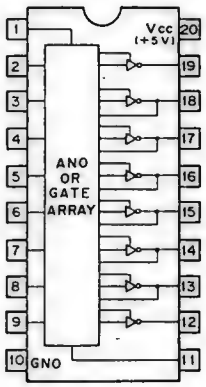
TOP VIEW (SCALE 4/1)



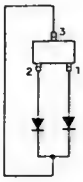
HD75452P (HITACHI)
–TOP VIEW –




HAL16L8CN
–TOP VIEW –

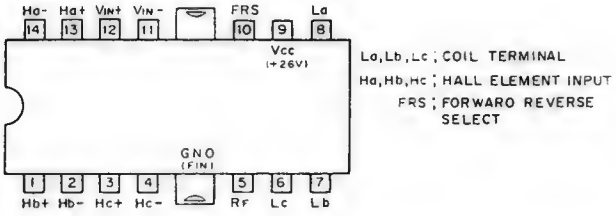



1S2837
TOP VIEW (SCALE 4/1)

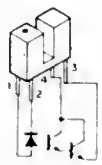


RD9.1M-B1
RD4.3M-B2
TOP VIEW (SCALE 4/1)

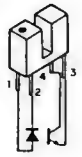
TA7259P (TOSHIBA)
MOTOR DRIVER
– TOP VIEW –

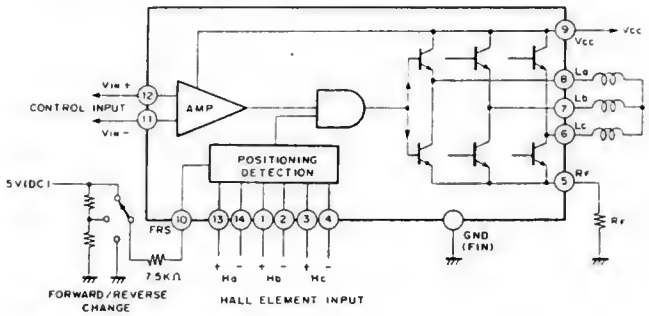



SPI201-20



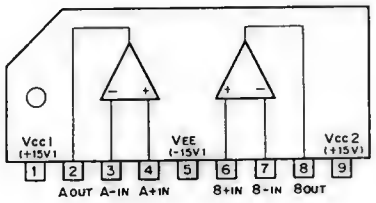
ON1110

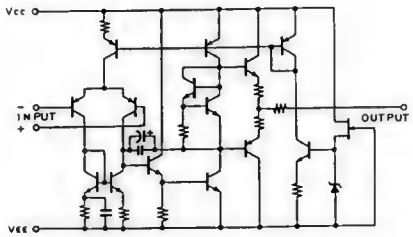




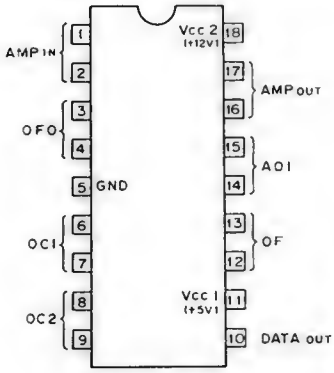

FRS ; FORWARD REVERSE SELECT

NJM4558S (JRC)
HIGH PERFORMANCE DUAL OPERATIONAL AMPLIFIER
– SIDE VIEW –

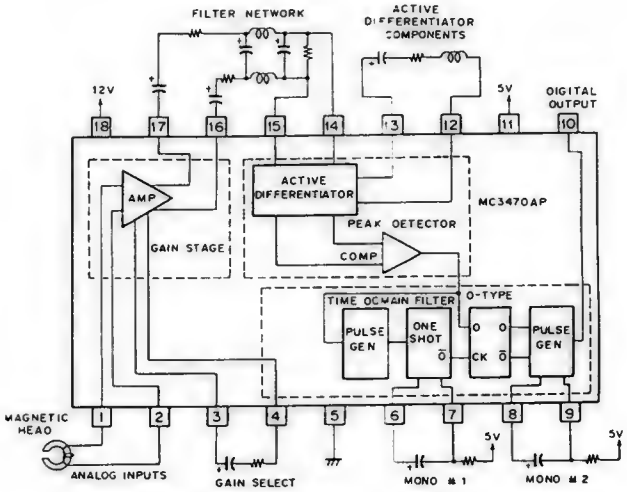


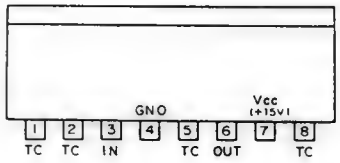

MC3470AP (MOTOROLA)
– TOP VIEW –

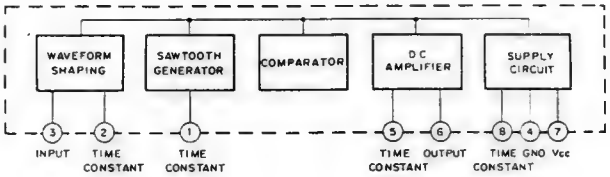



AMP IN ;AMPLIFIER INPUTS
OFO ;OFFSET DECOUPLING
OC ;ONE-SHOT COMPONENTS
AMP OUT ;AMPLIFIER OUTPUTS
AOI ;ACTIVE DIFFERENTIATOR INPUTS
DF ;DIFFERENTIATOR COMPONENTS

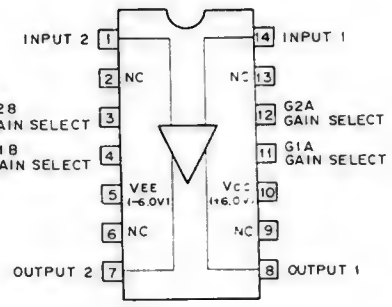


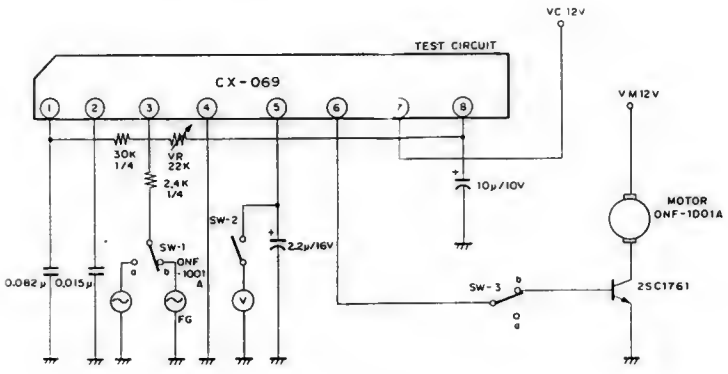

CX069A (MITSUBISHI)
– SIDE VIEW –




NE592N (MOTOROLA)
– TOP VIEW –

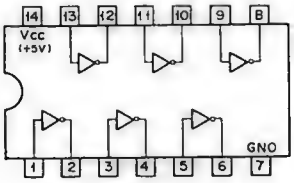


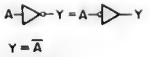




SINE WAVE OSC
1 Vp-p
f = fco ± Δf
fco = 450Hz

APPLICATION CIRCUIT
① SW-1→b, SW-2→OFF, SW-3→b
F-V CHARACTERISTICS TEST CIRCUIT
② SW-1→a, SW-2→ON, SW-3→a

SN7404N
– TOP VIEW –



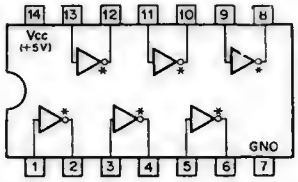




$Y = \overline{A}$

| A | Y |
|---|---|
| 0 | 1 |
| 1 | 0 |

0: LOW LEVEL
1: HIGH LEVEL

SN74LS05N
– TOP VIEW –

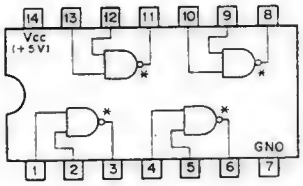


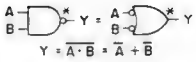
$Y = \overline{A}$

| A | Y |
|---|---|
| 0 | 1 |
| 1 | 0 |

0: LOW LEVEL
1: HIGH LEVEL
*: OPEN COLLECTOR

SN74LS26N (TI)
– TOP VIEW –

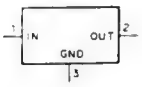



| A | B | X |
|---|---|---|
| 0 | 0 | 1 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |
| 1 | 1 | 0 |

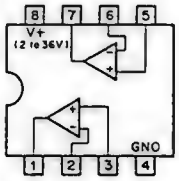
0: LOW LEVEL
1: HIGH LEVEL

μPC78L05A (NEC)
POSITIVE VOLTAGE REGULATOR (100 mA)

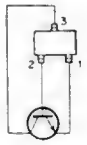



5 V μPC78L05 (A)

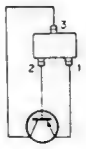
μPC393C
VOLTAGE COMPARATOR
– TOP VIEW –



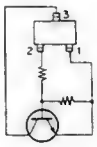

2SC2712
TOP VIEW (SCALE 4/1)




2SB624
TOP VIEW (SCALE 4/1)




DTC114EK
TOP VIEW (SCALE 4/1)



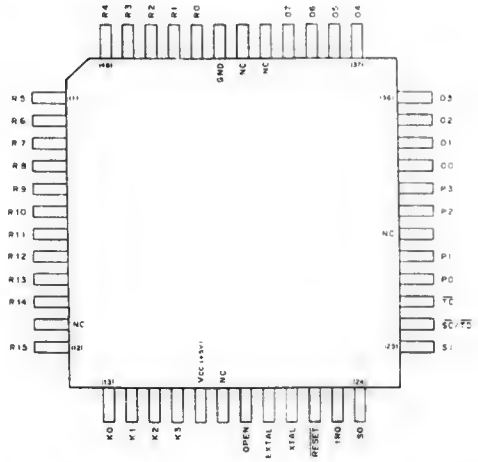

2SA937-R

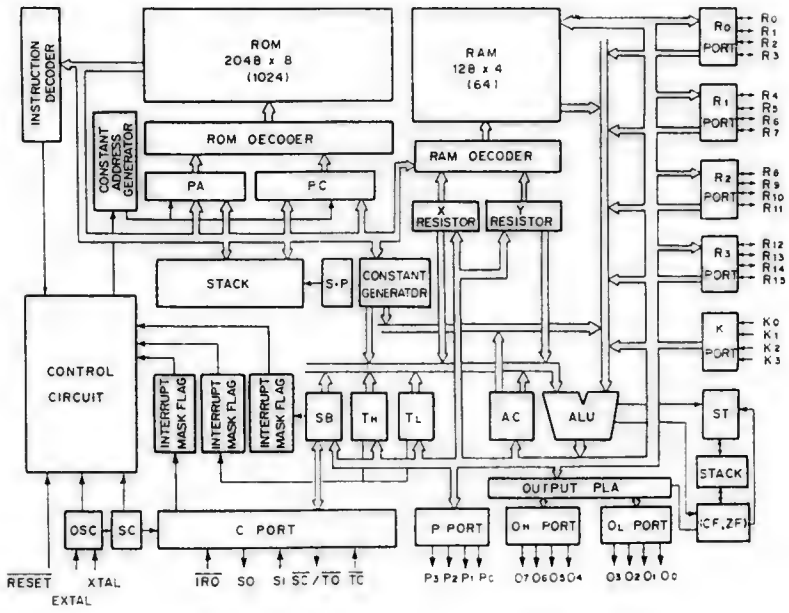
2SB734-4

2SC2021-R

2SC2878

MB8847-1199M
4-BIT ONE-CHIP MICROCOMPUTER
– TOP VIEW –




| | |
|---|---|
| R0 ~ R3 : R0 PORT | $\overline{TC}$ : TIMER COUNTER |
| R4 ~ R7 : R1 PORT | $\overline{SC}$ / $\overline{TO}$ : SERIAL SHIFT CLOCK / TIMING OUTPUT |
| R8 ~ R11 : R2 PORT | SI : SERIAL BUFFER INPUT |
| R12 ~ R15 : R3 PORT | SO : SERIAL BUFFER OUTPUT |
| K0 ~ K3 : K PORT | $\overline{IRQ}$ : INTERRUPT |
| O0 ~ O3 : OL PORT | EXTAL / XTAL : FOR X'TAL OR CLOCK INPUT |
| O4 ~ O7 : OH PORT | $\overline{RESET}$ : RESET INPUT |
| P0 ~ P3 : P PORT | |